Remarks/Arguments:

Reconsideration of the application as amended is requested.

Applicants request a one month extension of time to respond to the outstanding Office action, and a separate petition to this effect is enclosed.

The Examiner's remarks and cited references have been received and carefully considered. Originally presented claims 1, 4, 20, 22, 25, 45, 66, 80 and 82 have been amended, and new claims 83-89 have been added.

The Examiner made the previously entered species election as to Species A (Figs. 1-12 and 15-18) and Species B (Figs. 13 and 14) final. Applicants' prior traversal of the subject species election is hereby withdrawn, and the election of Species A for continued prosecution is confirmed. Applicants assert that with the exception of claims 19 and 63, all pending claims read on the elected Species A. Applicants assert that claims 19 and 63 depend from elected generic claims, such that the same should be allowed, along with the other pending claims, for those reasons set forth in detail below.

Applicants note with appreciation the Examiner's comment that claims 2-29, 40-43, 46-73, 79, 81 and 82 would be allowed if rewritten in independent form, including all of the limitations of the base claim and any intervening claims. The subject matter of original claim 2 is presented in new claim 83, with new claims 84-86 depending therefrom. The subject matter of original claim 28 is presented as new claim 86, the subject matter of original claim

29 is presented as new claim 88, and the subject matter of original claim 40 is presented as new claim 89. For those reasons set forth in greater detail below, Applicants assert that all pending claims are in condition for allowance.

The Examiner objected to claims 1 and 45 on the grounds that they contain certain informalities. Each of the informalities noted by the Examiner in the outstanding Office action has been corrected with those amendments presented herein. Also, claims 22, 66, 80 and 82, along with portions of the specification, have been amended to correct minor typographical and/or grammatical errors noted during the preparation of the present response.

The Examiner rejected original claims 1, 30-35 and 38 under 35 U.S.C. § 102(b) as being anticipated by the Hirano et al Patent 4,272,114. The Examiner also rejected original claims 36, 37, 39 and 44 under 35 U.S.C. § 103 as unpatentable over the Hirano et al '114 patent. For those reasons set forth in detail below, Applicants assert that the Hirano et al Patent 4,272,114 does not anticipate or render obvious the energy absorption impact system set forth in amended claim 1.

Claim 1 has been amended to recite in Jepson format a vehicle having a frame and a bumper in combination with an energy absorption impact system comprising a mounting plate operably connected with the frame, and including a central opening extending therethrough. The energy absorption system defined in amended claim 1 also includes a generally box-shaped, sheet metal energy absorption crush member having a top wall, a bottom wall and

an opposite sidewall arranged in a generally frustro-pyramidal shape, defining a larger end thereof operably connected with the bumper, and a smaller end thereof operably connected with the mounting plate about the central opening therein, whereby impact on the bumper inelastically deforms the top wall, the bottom wall and the opposite sidewalls of the crush member toward the central opening in the mounting plate to absorb energy associated with the impact.

The Hirano et al Patent 4,272,114 discloses an impact absorbing device, comprising a hollow polyhedral body 1 in the form of a frustum of a hollow quadrangular pyramid. The hollow polyhedral body 1 of Hirano et al '114 is formed from a single plate welded along the mating edges at joint line 2. A plurality of elongate slots or cutouts 3 are formed in each of the four sidewalls of the polyhedral body 1 which extend parallel with one another in a direction substantially orthogonal with respect to the longitudinal axis of the body 1. Each of the cutouts 3 has a width which is narrowest in the middle portion 3' of the length and increases generally toward the opposite ends 3''. A top plate 9 is welded to the smaller end of body 1, and includes a plurality of threaded holes 3 in which mounting bolts are received for connecting the smaller end of the body 1 with a vehicle bumper. A bottom plate 10 is welded to the larger end of body 1 and includes a plurality of bolt holes 12 in which mounting bolts are received for connecting the larger end of the body to a vehicle frame 13. When an impact force is imparted to the body 1 in the direction shown by the arrow in Fig. 1, the weakest zones "B", each

including cutouts 3, are successively compressed in an accordion fashion to assume the completely compressed or collapsed state shown in Fig. 4.

While the Hirano et al '114 impact absorbing device does teach a crush member having a generally frustro-pyramidal shape, the orientation of the device in a vehicle, as well as its operation, is quite different from that set forth in amended claim 1. In the Hirano '114 impact absorbing device, the top plate 9 at the smaller end of body 1 is connected to the vehicle bumper, and the bottom plate 10 at the larger end of the body 1 is connected with the vehicle frame 13. In the energy absorption impact system set forth in amended claim 1, the smaller end of the crush box is connected to the vehicle frame through the mounting plate, and the larger end of the crush box is connected with the bumper. Hence, the orientation of the crush box set forth in Applicants' amended claim 1 is precisely opposite to that disclosed in the Hirano et al '114 patent. The operation of the Hirano et al '114 impact absorbing device is similarly quite different from that of the energy absorption impact system set forth in Applicants' claim 1. In the Hirano et al '114 impact absorbing device, the body 1 collapses or compresses in an accordion fashion in the manner illustrated in Fig. 4. This collapsing action is facilitated by the cutouts 3 in the sides of the body. In contrast, impact upon the energy absorption system set forth in Applicants' claim 1 causes at least one of walls of Applicants' crush member to bulge outwardly into a roughly convex configuration. The walls of the crush member set forth in Applicants' claim 1 do not collapse in an accordion fashion, as taught by

the Hirano et al '114 patent. Hence, Applicants assert that the energy absorption impact system set forth in amended claim 1 is clearly patentable over the Hirano et al '114 impact absorbing device due to those structural and functional differences specifically outlined above.

The remaining references of record have been carefully examined, and none teach or suggest those features noted above as lacking in the Hirano et al '114 reference.

Claims 2-44 depend directly or indirectly from amended claim 1, and recite additional structure and feature which Applicants believe further distinguish the same from the Hirano et al '114 reference.

Pending claim 45 recites a method for making an energy absorption impact system, and has been amended herein to recite the steps of forming a mounting plate with a central opening therethrough, forming a generally box-shaped, sheet metal energy absorbing crush member having a top wall, a bottom wall and oppositely inclined sidewalls arranged in a generally frustro-pyramidal shape, defining a larger end thereof adapted for connection with a vehicle bumper, and a smaller end thereof adapted for connection with the mounting plate. The method set forth in amended claim 45 also recites the steps of positioning the smaller end of the crush member on the mounting plate about the central opening, and rigidly fastening the smaller end of the crush member to the mounting plate. The method set forth in amended claim 45 further recites the steps of rigidly fastening the mounting plate to an end of a vehicle frame, and connecting a vehicle bumper to the larger end of the crush member, whereby

impact on the vehicle bumper inelastically deforms the top wall, the bottom wall and the opposite sidewalls of the crush member toward the central opening in the mounting plate to absorb energy associated with the impact.

Like apparatus claim 1 discussed above, in the method set forth in amended claim 45, the smaller end of the crush member is attached to the vehicle frame through the mounting plate, and the larger end of the crush member is attached to the bumper. This orientation of the crush member, as set forth in amended claim 45, is clearly opposite to the arrangement taught by the Hirano et al '114 patent, and results in those operational differences discussed in detail above. Consequently, Applicants assert that amended claim 45 patentably distinguishes over the Hirano et al '114 patent, as well as the other references of record.

Claims 46-82 depend directly or indirectly from amended claim 45 and add additional steps thereto which Applicants believe further distinguish the same from the cited prior art.

In the Examiner's rejection of claims 36 and 37 under 35 U.S.C. § 103 over the Hirano et al '114 patent, the Examiner states that,

> "Official notice is being taken that tuning the energy absorption characteristics by adjusting the physical dimensions (size, thickness, angles) of the energy absorber is well known in the art."

Applicants traverse the Examiner's position relative to official notice, and believe that the same is not well known in the art, and request that an appropriate reference be cited to support the Examiner's position.

The Examiner rejected claims 45, 74, 75, 78 and 80 under 35 U.S. C. § 103 as being unpatentable over the Hirano et al '114 patent in view of the Yamamuro et al Patent 6,334,638. More specifically, the Examiner states,

> "Hirano et al. does not disclose the claimed arrangement of the crush member with respect to the vehicle frame and the bumper.
>
> Yamamuro et al. teach connecting the larger end of an energy absorber (26) to a bumper and the smaller end to a mounting plate (26) that is welded to the vehicle frame (17).
>
> It would have been obvious to one of ordinary skill in the art at the time the invention was made to attach the larger end of the crush member of Hirano et al. to the bumper, as taught by Yamamuro et al., and to weld the mounting plate to the vehicle frame, as taught by Yamamuro et al., to allow the crush member/mounting plate to mounted on a smaller sized frame vehicle while retaining the same energy absorption characteristics."

While Applicants agree with the Examiner's statement that the Hirano et al '114 patent does not disclose the claimed arrangement of the crush member with respect to the vehicle frame and the bumper, Applicants believe that the Yamamuro et al patent does not teach connecting

the larger end of an energy absorber to a bumper and the smaller end to a mounting plate in the manner set forth in amended claim 45, as discussed above.

The Yamamuro et al Patent 6,334,638 discloses an assembly for attaching a bumper beam 23 to the rear of an associated vehicle frame 17, using a pair of crush boxes 26. As best illustrated in Fig. 3, the crush box members 26 are made of aluminum, and have a generally C-shaped configuration defined by a vertical web with integrally formed horizontal top and bottom members, and two side plates 42 and 43 which are inserted into the opposite sides of the C-shaped channel member. While the top and bottom portions of the channel member have the outer edge which is tapered in the horizontal plane to accommodate for the shape of the bumper beam 23, the walls of the Yamamuro et al '638 crush members do not assume a frustro-pyramidal shape, as set forth in Applicants' amended claims 1 and 45, as discussed above. The sides of the Yamamuro et al '638 crush box members 26, as best shown in Fig. 5, are defined by side plates 42 and 43, are disposed in a mutually parallel relationship, as are the top and bottom portions of the channel member, as shown in Fig. 4. Hence, the walls of the Yamamuro et al '638 crush box member 26 are not inclined or otherwise arranged in a generally frustro-pyramidal shape, as set forth in Applicants' amended claims 1 and 45. The associated crushing action of the Yamamuro et al crush box members 26, as shown in Figs. 7A and 7B, is an accordion-like compression of the top and bottom portions of the channel member, and presumably associated side plates 42 and 43, which is quite different from the

crushing action of the crush box member recited in Applicants' claims 1 and 45, as discussed in detail above with respect to the Hirano et al '114 patent.

While some combination of the teachings of the Hirano et al '114 patent and the Yamamuro et al '638 patent would likely be appropriate, the Examiner's proffered position relating to these combined teachings is believed to be inappropriate, and constitutes hindsight reconstruction of Applicants' own invention. Any appropriate combination of the Hirano et al '114 reference and Yamamuro et al '638 reference would teach attaching the top plate 9 at the smaller end of the Hirano et al '114 crush box to the bumper, and the bottom plate 10 at the larger end of the crush box to the vehicle frame, such that the crush box will compress in an accordion-like fashion as shown in Fig. 4 of the Hirano et al '114 patent. Since this orientation is opposite to that set forth in Applicants' claims 1 and 45, the same are believed to be patentable thereover.

The remaining references of record have been carefully examined, and none teach or suggest those features noted above as lacking in the Hirano et al '114 and Yamamuro et al '638 patents.

New claims 83-86, 87, 88 and 89 define subject matter which the Examiner previously indicated allowable in original claims 2, 28, 29 and 40, respectively. Hence, these claims are believed to patentable over the references of record for those reasons the Examiner deemed original claims 2, 28, 29 and 40 to be patentable.

Applicants submit that the amended claims are sufficiently definite under 35 U.S.C. § 112, so as to reasonably apprise those skilled in the art as to their scope. Applicants further submit that the references of record do not teach or in any way suggest the energy absorption impact system recited in the amended claims. The hypothetical combination of references upon which the Examiner relied in his rejection of the original claims is simply not suggested or contemplated by the references themselves, and therefore constitutes an improper hindsight reconstruction of Applicants' own invention. It is therefore respectfully submitted that claims 1-89 inclusive should be allowed, since the references, taken singly or in any combination, do not teach the energy absorption impact system set forth therein. A notice to this effect is earnestly solicited.

Respectfully submitted,

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CERTIFICATE OF MAILING

I hereby certify that this correspondence, and all identified enclosures and attachments are being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, PO Box 1450, Alexandria, Virginia 22313-1450, on 1/18/06.

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CSC/jkrp
Enclosures